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(71) Applicant(s)

Mitsubishi Denki Kabushiki Kaisha

(Incorporated in Japan)

No. 2-3 Marunouchi 2-chome, Chiyoda-ku, Tokyo 100,  
Japan

(72) Inventor(s)

Junichi Kitsuki

(74) Agent and/or Address for Service

J A Kemp & Co

14 South Square, Gray's Inn, LONDON, WC1R 5LX,  
United Kingdom

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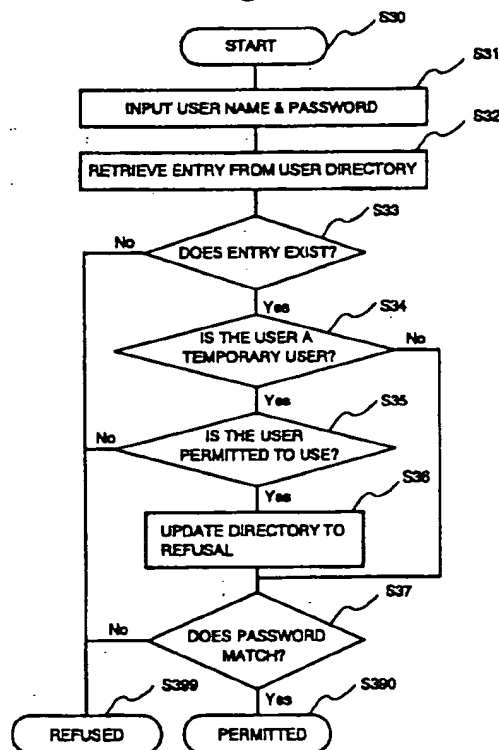
INT CL<sup>6</sup> G06F

ONLINE:WPI

(54) Information processor

(57) A temporary user is permitted a right to use an information processor only temporarily. A directory registers user name, user password and right to use attribute. If a user logging on is permitted to use, the directory is updated to cancel the right, to prevent later use. Alternatively, the directory may specify number of permissions, or a time interval. The initial use may depend on current time or number of failures. Non-temporary users may be distinguished.

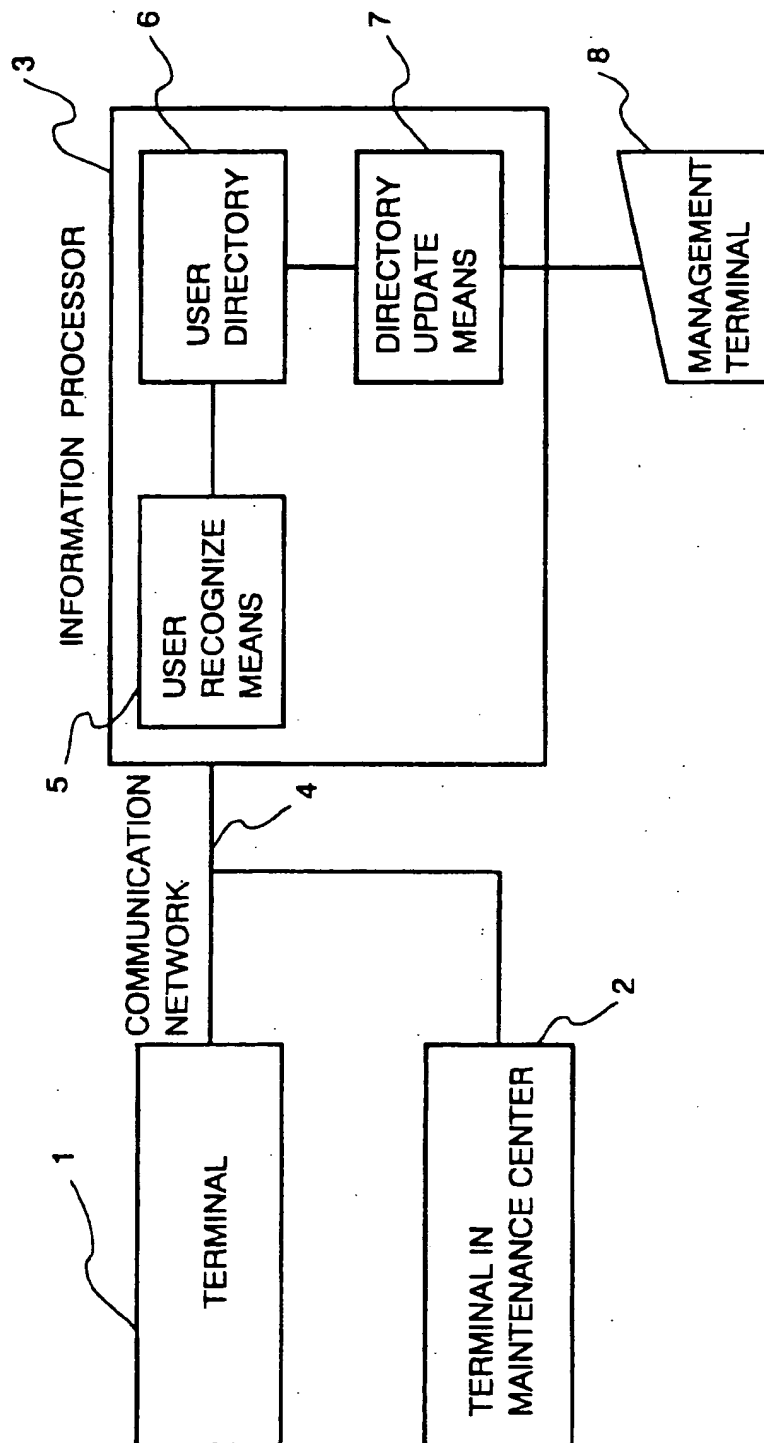
Fig.3



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Fig.1



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Fig.2A

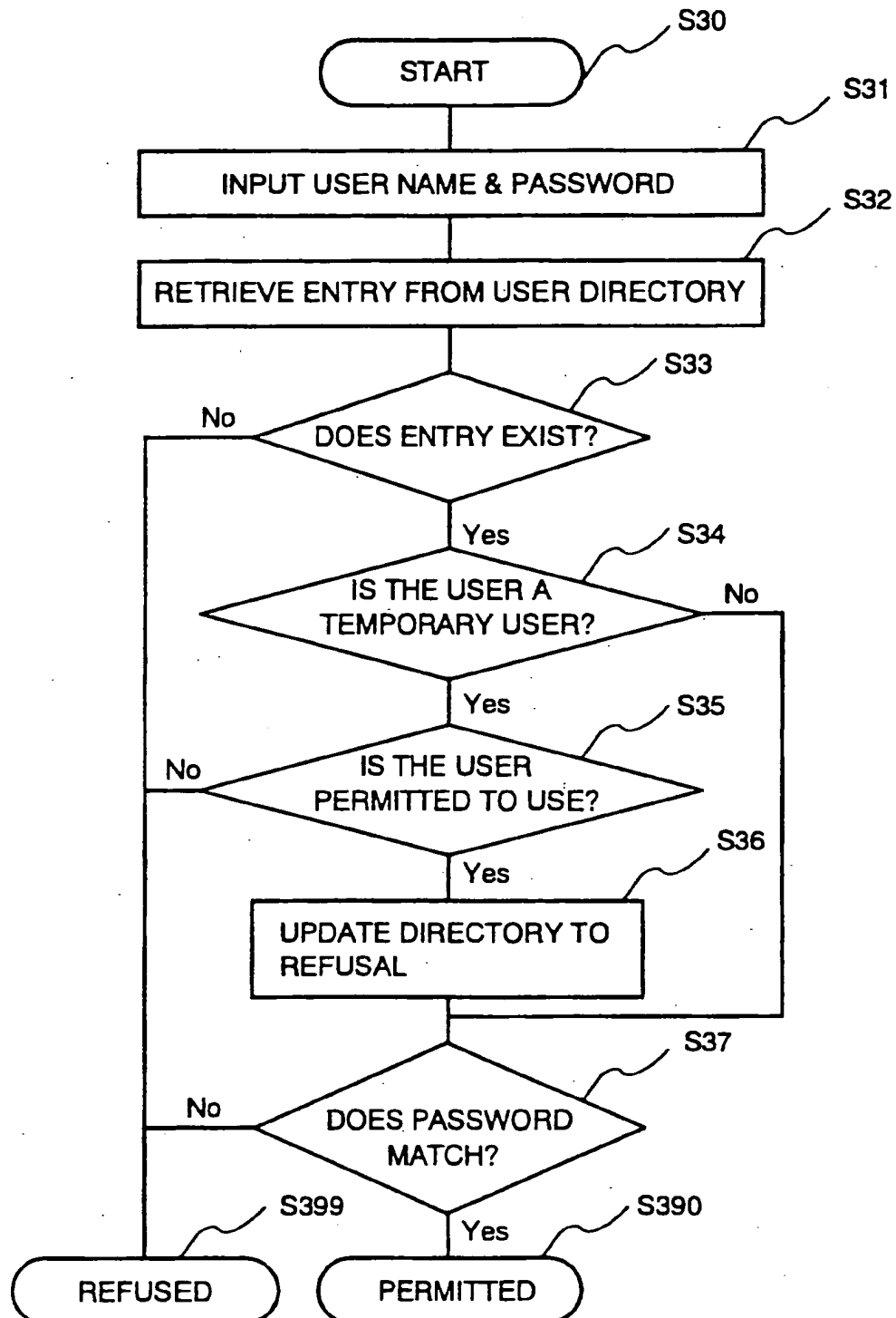
USER NAME	PASSWORD	.....	TEMPORARY USE	PERMISSION	.....
A A A	X X X X	.....	○	x	.....
B B B	Y Y Y Y	.....	x	—	.....
C C C	Z Z Z Z	.....	x	—	.....
D D D	U U U U	.....	○	x	.....

Fig.2B

USER NAME	PASSWORD	.....	TEMPORARY USE	PERMISSION	.....
A A A	X X X X	.....	○	○	.....
B B B	Y Y Y Y	.....	x	—	.....
C C C	Z Z Z Z	.....	x	—	.....
D D D	U U U U	.....	○	x	.....

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Fig.3



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Fig.4

<u>6</u>				
61		62	65	
USER NAME	PASSWORD	.....	NO. OF PERMISSIONS	.....
AAA	XXXX	.....	0	.....
BBB	YYYY	.....	3	.....
CCC	ZZZZ	.....	-1	.....

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Fig.5

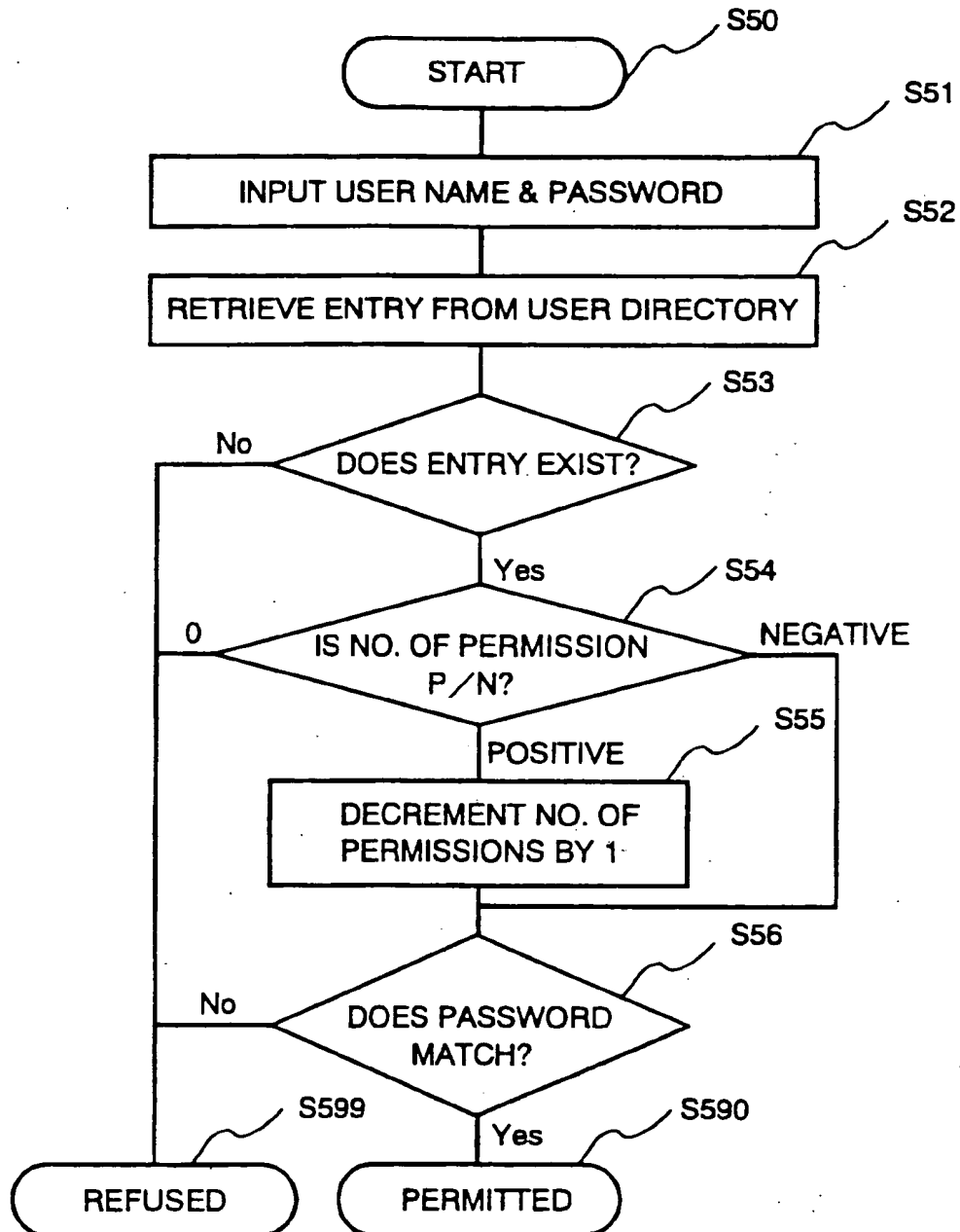


Fig.6

61 USER NAME	62 PASSWORD	63 TEMPORARY USE	66 TIME LIMIT	.....
AAA	XXXX	O	94/04/30 13:54:20	.....
BBB	YYYY	X	—	.....
CCC	ZZZZ	X	—	.....
DDD	UUUU	O	94/01/01 00:00:00	.....

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Fig.7

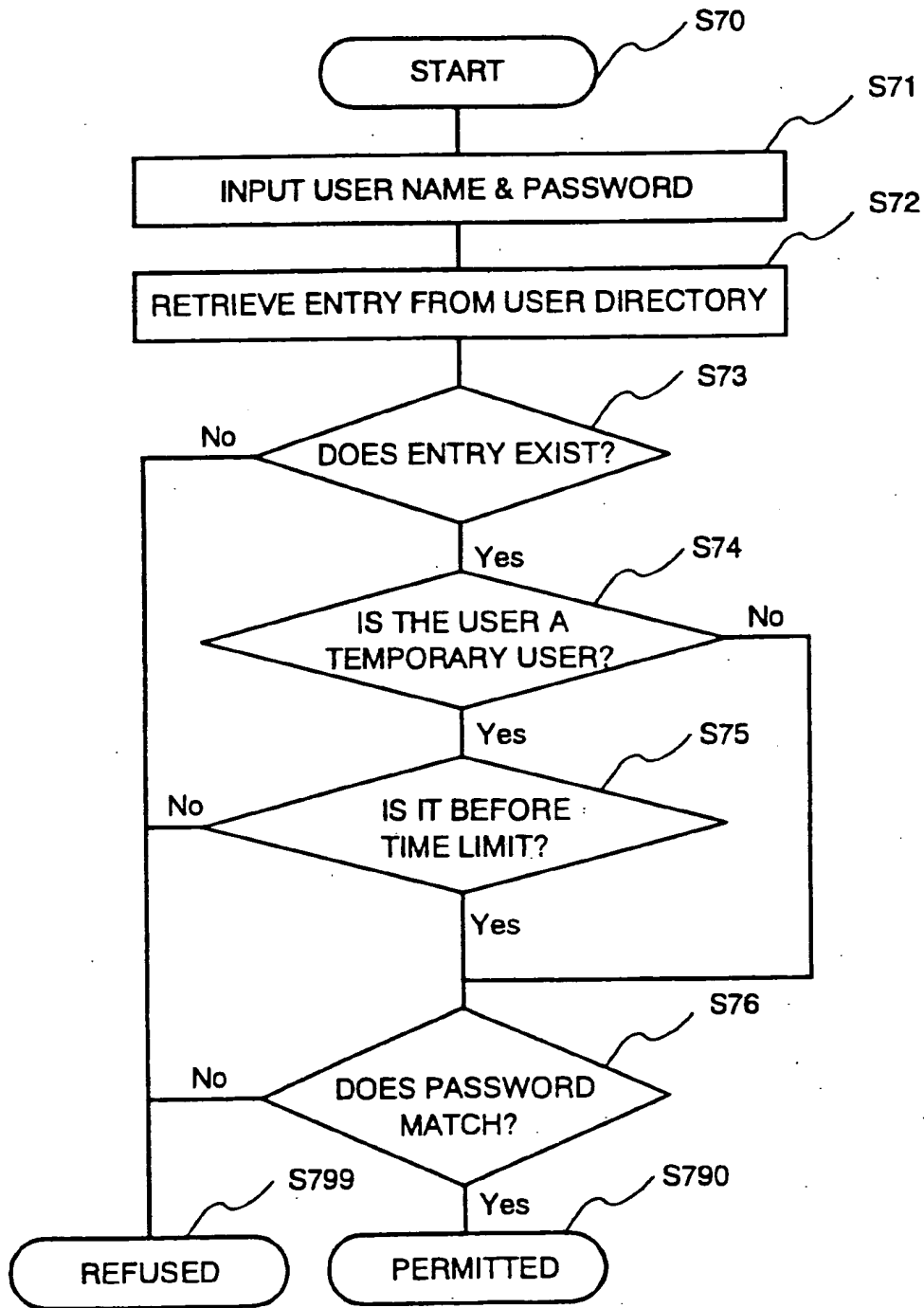


Fig.8

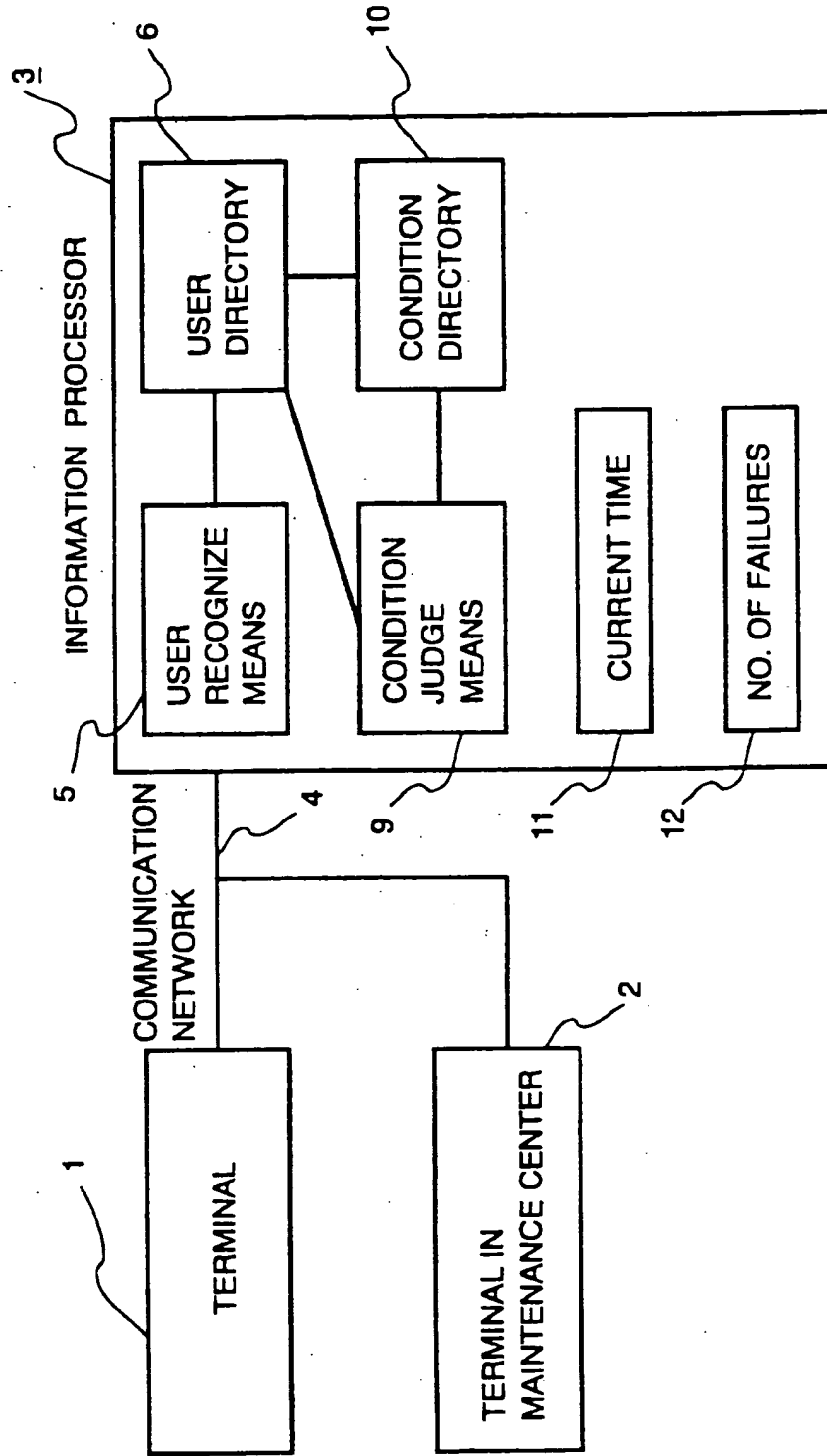


Fig.9

VARIABLE	RELATION	REFERENCE VALUE	VARIABLE CLASS	.....
CURRENT TIME	≥	94/04/30 02:00:00	TIME	.....
NO. OF FAILURES	>	5	NO.	.....

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Fig.10

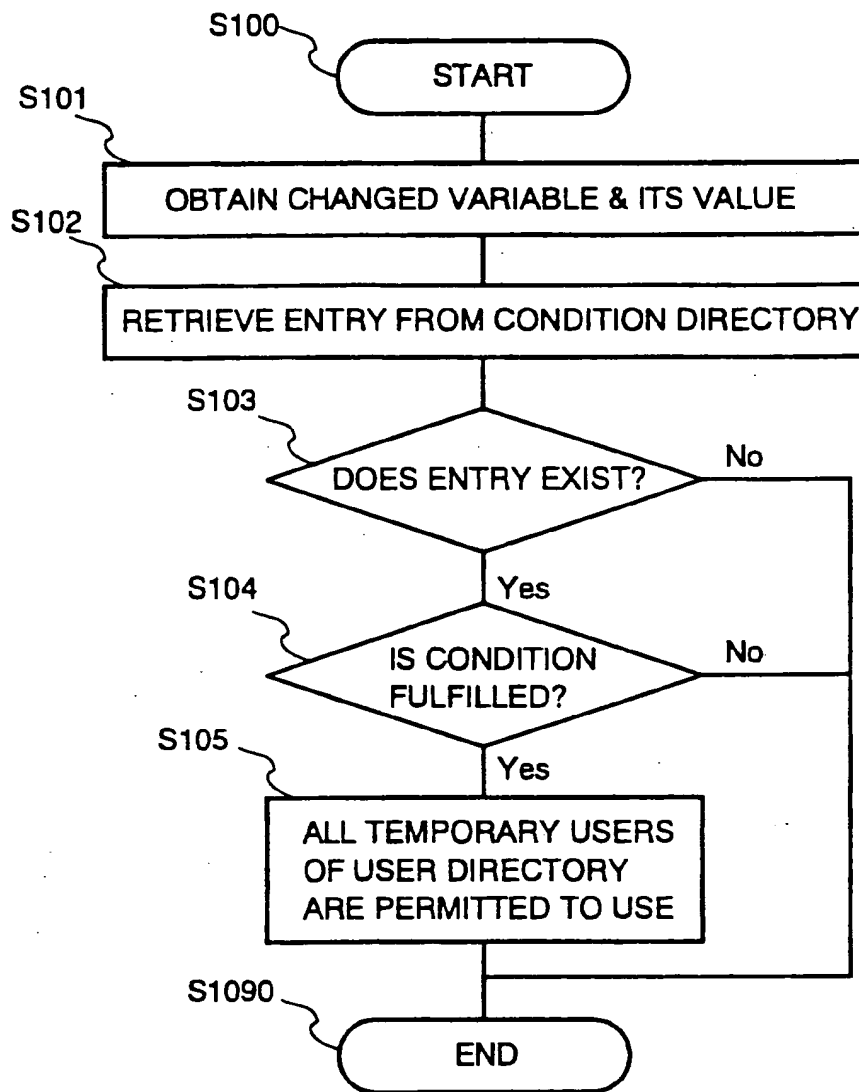


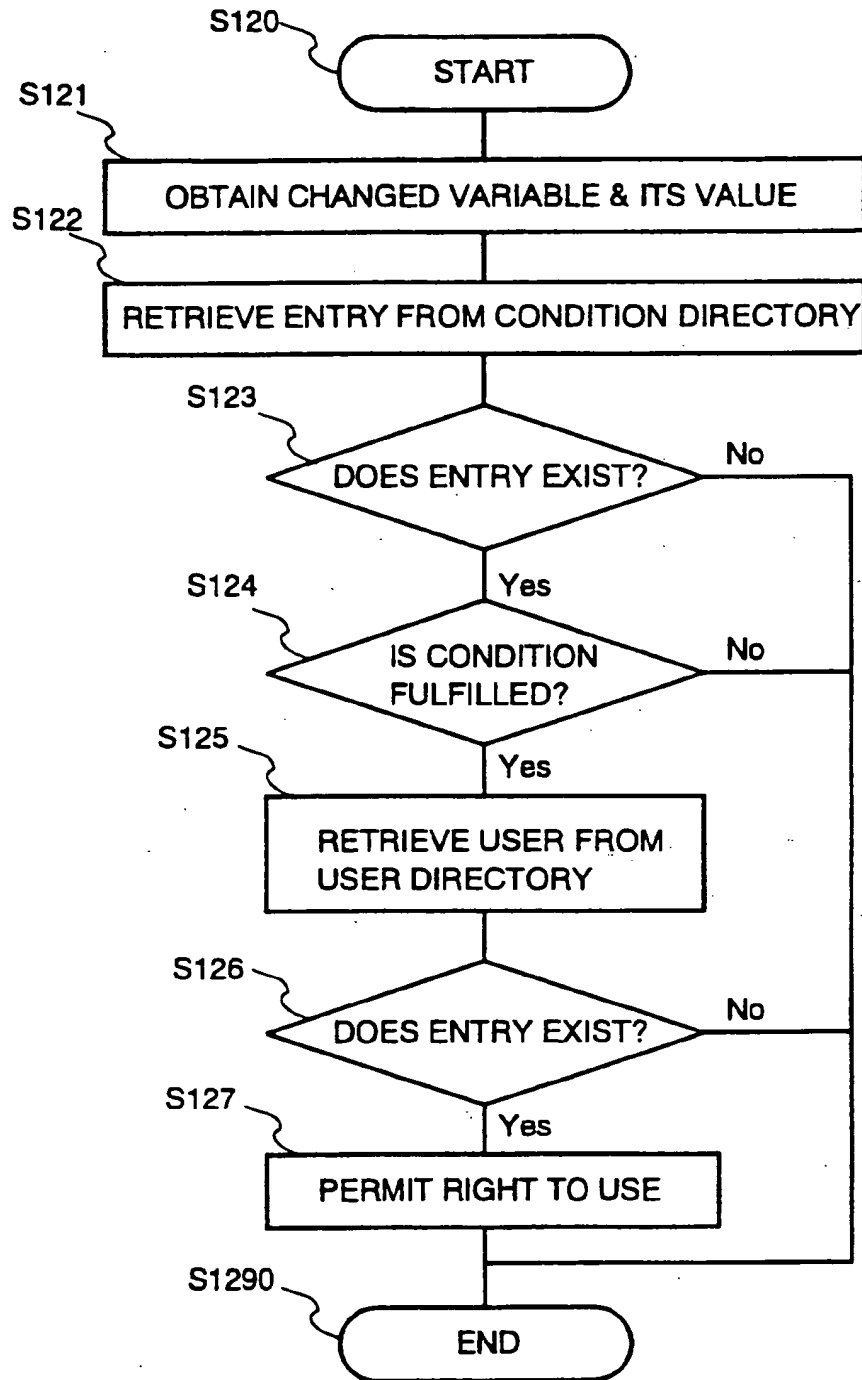
Fig.11

VARIABLE	RELATION	REFERENCE VALUE	VARIABLE CLASS	.....	USER	.....
CURRENT TIME	≥	94/04/30 02:00:00	TIME	.....	A A A	.....
NO. OF FAILURES	>	5	NO.	.....	D D D	.....

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Fig.12



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Fig.13

VARIABLE	RELATION	REFERENCE VALUE	VARIABLE CLASS	.....	USER CLASS	.....
CURRENT TIME	≥	94/04/30 02:00:00	TIME	.....	1	.....
NO. OF FAILURES	>	5	NO.	.....	2	.....

Fig.14

USER NAME	PASSWORD	.....	TEMPORARY USE	PERMISSION	CLASS	.....
AAA	XXXX	.....	O	x	1	.....
BBB	YYYY	.....	x	—	—	.....
CCC	ZZZZ	.....	x	—	—	.....
DDD	UUUU	.....	O	x	2	.....
EEE	VVVV	.....	O	x	1	.....

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Fig.15

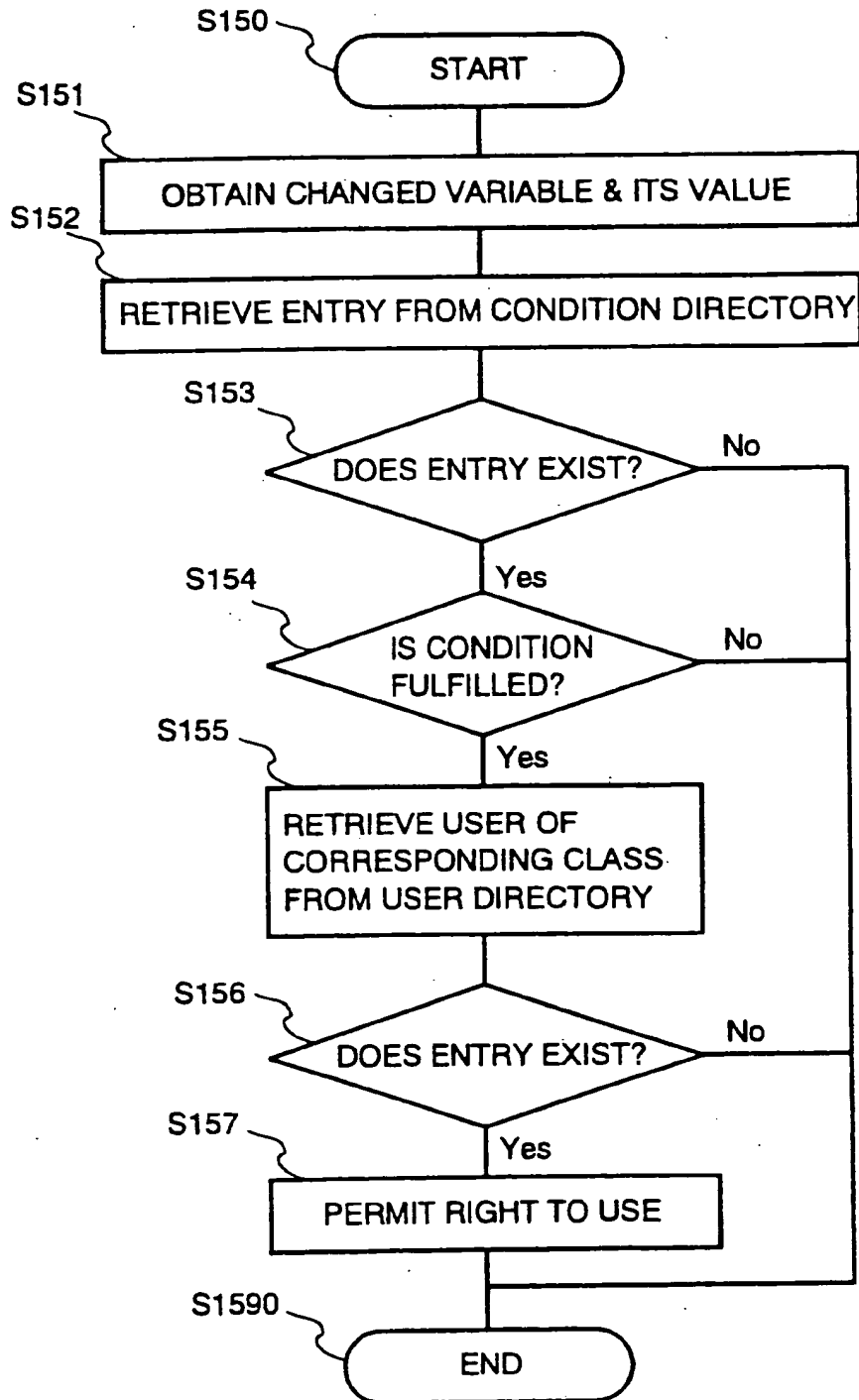


Fig.16

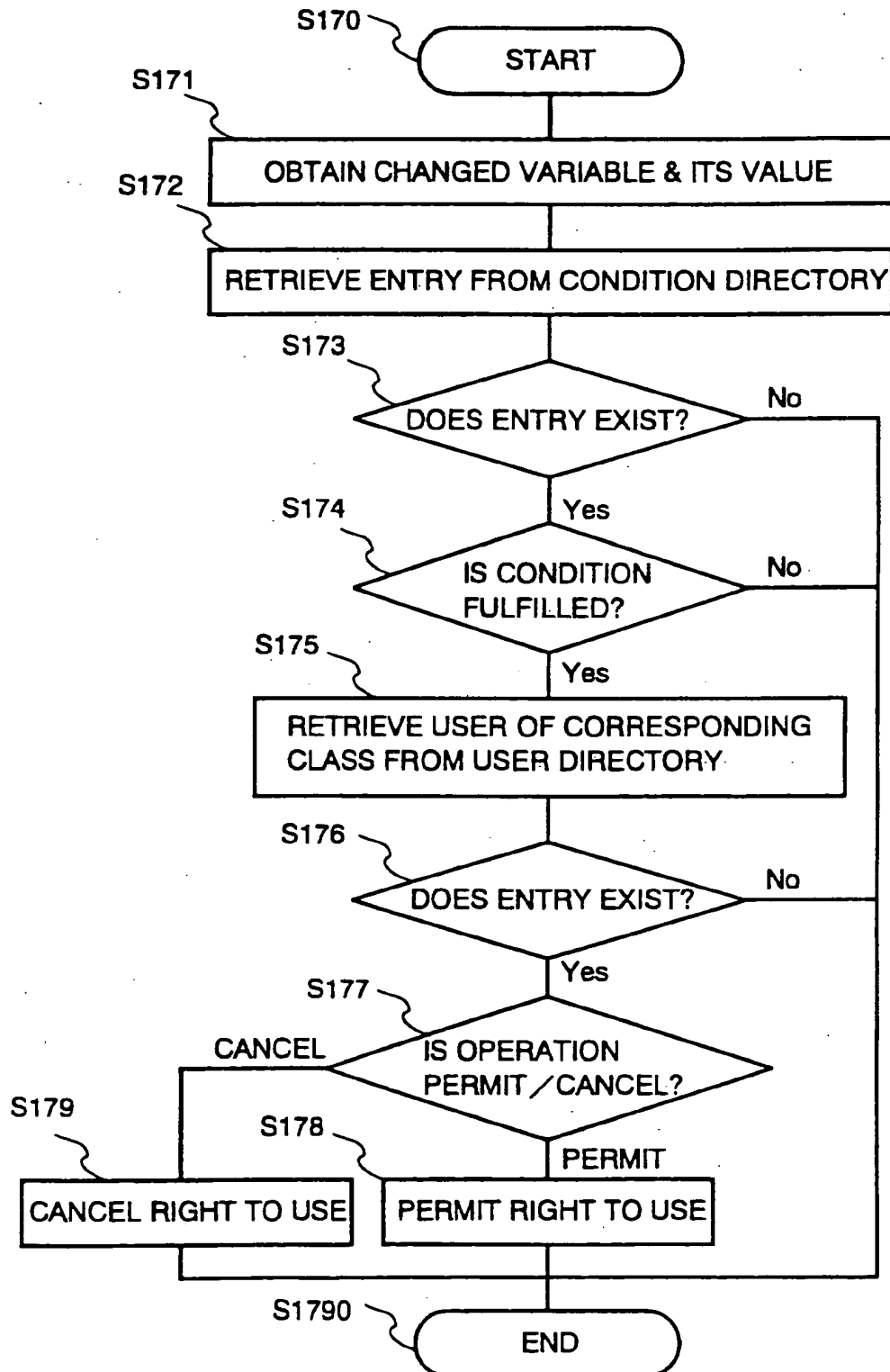
10

VARIABLE	RELATION	REFERENCE VALUE	VARIABLE CLASS	USER CLASS	OPERATION	.....
CURRENT TIME	$\geq$	94/04/30 02:00:00	TIME	1	PERMIT	.....
CURRENT TIME	$<$	94/04/30 02:30:00	TIME	1	CANCEL	.....
NO. OF FAILURES	$>$	5	NO.	2	PERMIT	.....
NO. OF FAILURES	$<$	3	NO.	2	CANCEL	.....

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Fig.17



## INFORMATION PROCESSOR

This invention relates to security protection of an information processor, especially to a method for  
5 permitting/cancelling a temporary right to use the information processor under predetermined conditions.

Conventionally, on using an information processor, a user name and a password are checked to verify the user's right to use.

10 The right to use the information processor may not be permitted in a normal status to a special user or maintenance engineer who has only a temporary right to use the information processor only under predetermined condition, e.g., when an error occurs in the information  
15 processor, or maintenance time. Such a user is not permitted to use the information processor unless indicated by a manager of the information processor under predetermined condition. Or the manager may permit such a user's right to use by registering the user  
20 temporarily.

Another conventional system is used in a service processor of the 3090 processor series of IBM, U.S.A. According to this system, the password of the user is changed automatically for every use, and a new password  
25 is assigned to the user to permit the right to use by the

manager before every access to the processor.

5 As has been described, conventionally, the manager of the information processor must always intervene in processing to permit the user the temporary right to use under predetermined condition, even when the password is changed automatically for every use such as in the system for the service processor of 3090 processor series of IBM, U.S.A.

10 And the manager must always cancel the temporary right to use of the user after every processing both when the manager permits the user the temporary right to use the information processor and when the manager registers the user temporarily. If the manager does not cancel the temporary right to use, the information processor may be used improperly.

15 This invention is provided to solve the above-mentioned problems.

According to the present invention, there is provided an information processor comprising:

- 20 (a) a user directory for registering a user name, a user's password and an attribute for a user's right to use;
- (b) directory update means for updating the attribute for the right to use of the user directory to permit the user the right to use the information processor; and
- 25

(c) user recognize means for recognizing the user on logging in, for judging the user's right to use the information processor by referring to the user directory, and for updating the user directory to cancel the right to use of the user.

Thus in an information processor of the invention, the temporary right to use, permitted to a user under predetermined condition, can be canceled automatically or can be limited without an intervention of the manager.

Also, in the information processor of the invention, the temporary right to use of a registered user can be permitted automatically without the intervention of the manager under the predetermined condition.

Thus, with the invention, the user recognize means recognizes the user and updates the user's attribute for the right to use registered in the user directory when the user logs in, so that the user is not permitted the right to use unnecessarily, which prevents the information processor from being improperly used.

The temporary right to use can be cancelled at logging-in time of the user, so that the user cannot log in unless permitted the right to use once again, which prevents the information processor from being improperly used.

The right to use can also be permitted with a time

limit, so that the user, who needs a lot of times of log-ins to process some work, can work without caring the number of log-ins. The load of the manager of the information processor can be reduced because he does not  
5 need to permit the right to use for the temporary user's every access.

The condition to permit the temporary right to use to the temporary user can be registered in the condition directory, and the condition judge means can detect the  
10 fulfillment of the condition to permit the right to use.

It is also possible for the user to be registered in the condition directory to permit the temporary right to use under predetermined condition, the right to use can be thus permitted to only the specified user  
15 corresponding to the fulfilled condition. So the right to use is not permitted to the user unnecessarily and the information processor is prevented from being improperly used.

The temporary users can be divided into classes and the user's class can be registered in the condition  
20 directory. The temporary right to use can be permitted to all the users of the specified class, which enables more efficient processing.

The condition to permit/to cancel the temporary  
25 right to use can be registered in the condition

directory, so that the temporary right to use can be permitted/cancelled automatically.

Further, the condition judge means can permit the temporary right to use and the user recognize means can  
5 cancel the temporary right to use when the specified condition is fulfilled. Thus the temporary right to use can be permitted and cancelled automatically. The permission or cancellation is done when the user logs in, which prevents the information processor from being  
10 improperly used.

The invention will be further described by way of non-limitative example with reference to the accompanying drawings, in which:-

Fig. 1 shows a general configuration of one  
15 embodiment according to the invention;

Figs. 2A and 2B show examples of the user directory;

Fig. 3 is a flowchart showing the operation of the user recognize means;

Fig. 4 shows another example of the user directory  
20 according to a second embodiment of the invention;

Fig. 5 is a flowchart showing the operation of the user recognize means according to the second embodiment of the invention;

Fig. 6 shows another example of the user directory  
25 according to a third embodiment of the invention;



Fig. 7 is a flowchart showing the operation of the user recognize means according to the third embodiment of the invention;

5 Fig. 8 is a block diagram showing a general configuration of a fourth embodiment according to the invention;

Fig. 9 shows an example of the condition directory according to the fourth embodiment of the invention;

10 Fig. 10 is a flowchart showing the operation of the condition judge means according to the fourth embodiment of the invention;

Fig. 11 shows another example of the condition directory according to a fifth embodiment of the invention;

15 Fig. 12 is a flowchart showing the operation of the condition judge means according to the fifth embodiment of the invention;

20 Fig. 13 shows another example of the condition directory according to a sixth embodiment of the invention;

Fig. 14 shows another example of the user directory according to the sixth embodiment of the invention;

25 Fig. 15 is a flowchart showing the operation of the condition judge means according to the sixth embodiment of the invention;

Fig. 16 shows another example of the condition directory according to a seventh embodiment of the invention; and

5 Fig. 17 is a flowchart showing the operation of the condition judge means according to the seventh embodiment of the invention.

#### Description of Preferred Embodiments

##### Embodiment 1.

10 Figs. 1 - 3 explain one embodiment according to the invention, where a temporary right to use an information processor is permitted by a manager of the information processor, but the right to use is cancelled automatically without the intervention of the manager.

15 Fig. 1 shows a general configuration of the embodiment. In Fig. 1, a terminal 1 is connected to an information processor 3 via a communication network 4. A terminal 2 is located in a maintenance center and is also connected to the information processor 3 via the communication

20 network 4. When a user tries to log in, a user recognize means 5 judges the user's right to use the information processor. If the user's right is judged to be proper, the user recognize means 5 permits the user to log in and then cancels the user's right to use. The user recognize

25 means 5 judges the user's right to use by referring to a

user directory 6, where the names and information of the users are registered. The manager of the information processor 3 updates the user directory 6 by a directory update means 7 with a management terminal 8 to permit the user the temporary right to use.

Figs. 2A and 2B show examples of the configuration of the user directory 6. In the user directory 6 shown in the examples of the figures, an attribute for temporary use 63 and an attribute for permission are provided as well as names 61 and passwords 62 of the users. The attribute for temporary use 63 shows whether the user is a temporary user or not. The attribute for permission shows whether the temporary user is permitted to use the information processor 3 or not. In Fig. 2A, the right to use of a temporary user AAA is cancelled. In Fig. 2B, the temporary user AAA is permitted the temporary right to use. Fig. 3 is a flowchart showing the operation of the user recognize means 5.

Referring to Figs. 2A, 2B and 3, the operation will be explained hereinafter. Generally, for example, in case an error occurs in the information processor or in case of a periodical maintenance, a person in charge of repair or maintenance has to be permitted the right to use the information processor. Thus, the manager of the information processor 3 changes the attribute for

permission 64 of a proper temporary user to permission  
under predetermined condition. For example, when an  
error occurs in hardware, a person in charge of the  
hardware diagnosis should be permitted the temporary  
5 right to use to diagnose the error. If AAA shown in  
Figs. 2A and 2B is permitted the temporary right to use,  
the status of the user directory 6 becomes the status  
shown in Fig. 2B. The manager informs AAA of the  
hardware error and of the permission of the temporary  
10 right to use.

On accessing the information processor 3 from the  
terminal 1 or the terminal 2 in the maintenance center  
via the communication network 4, a temporary user  
permitted the temporary right to use has to be recognized  
15 by the user recognize means 5.

At user's request for accessing, the user recognize  
means 5 demands a user name and a password of the user.  
After the user inputs the name and the password (step S31  
in Fig. 3), the user recognize means 5 recognizes the  
20 user in the following procedure.

The user recognize means 5 retrieves the user's  
entry according to a user name 61, namely the name input  
by the user at step S31, from the user directory 6 (step  
S32). If there exists no user's entry corresponding to  
25 the user name 61 in the user directory 6 (step S33), the

user is not permitted to use the information processor  
(step S399). If there is corresponding user's entry,  
then the user is judged to be a temporary user or not by  
checking the attribute 63 for temporary use of the  
5 retrieved user's entry (step S34). If the user is not a  
temporary user, the user is recognized as a constant user  
and the password 62, namely the password input by the  
user at step S31, is confirmed (step S37). If the user  
is a temporary user, then the attribute 64 for permission  
10 is checked (step S35). If the attribute 64 for  
permission shows permission, the attribute 64 is changed  
to refusal (step S36), and then the password 62 of the  
user is confirmed (step S37). If the attribute 64 for  
permission shows refusal, the user is refused to use the  
15 information processor (step S399).

In the predescribed way, the right to use of the  
temporary user is automatically updated to refusal by the  
user recognize means 5 once the temporary user accesses  
the information processor 3. Accordingly, such a  
20 temporary user has to be permitted a temporary right to  
use before every access to the information processor.  
This prevents the information processor from being  
improperly used.

In Embodiment 1, the user directory 6 includes the  
25 attribute 63 for temporary use. This attribute 63 can be

eliminated by indicating the constant user. Namely, the attribute 64 for permission may be set to show permission for constant use besides permission/refusal. In this case, the constant user can be indicated by the permission for permanent use included in the attribute 64 for permission. The number of the attributes can be thus reduced concerning the right to use.

#### Embodiment 2.

Figs. 4 and 5 explain another embodiment of the invention, where the temporary right to use is permitted by the manager and the right is automatically canceled without an intervention of the manager. In this embodiment, the temporary right to use is cancelled automatically after the temporary user accesses the information processor predetermined number of times. A general configuration of this embodiment is the same as Embodiment 1 shown in Fig. 1.

Fig. 4 shows an example of the user directory 6 according to the embodiment. As shown in the figure, the user directory 6 includes an attribute 65 for number of permissions besides the user name 61 and the password 62. The attribute 65 for number of permissions shows how many times a user can be permitted a temporary right to use the information processor. If the attribute 65 for number of permissions is zero, the user cannot be

permitted the right to use the information processor. If the attribute 65 for number of permissions is not zero, the user can be permitted the right to use the information processor. The constant user having a constant right to use is indicated by a negative number as the attribute 65. As described above, a binary number with plus/minus sign is used for the attribute 65 for number of permissions in this Embodiment 2. In Fig. 4, a user AAA is a temporary user having refusal for the right to use at present, a user BBB is a temporary user having permission for the right to use at present, and a user CCC is a constant user having a constant right to use. Fig. 5 is a flowchart showing the operation of the user recognize means 5.

In the following, this embodiment will be explained mainly in relation to different aspects from Embodiment 1 referring to Figs. 4 and 5. In this embodiment, the attribute 65 for number of permissions in the user directory 6 is decremented by 1 after every access of the temporary user, while the attribute 64 for permission in the user directory 6 is updated after every access in Embodiment 1.

The operation of the user recognize means 5 will be explained referring to Fig. 5. In the operation of the user recognize means 5, the procedure from step S51,

where the user name and the password are input, to step S53, where the user's entry is retrieved according to the user name 61 at step S53, is the same as from step S31 to step S33 in Fig. 3 of Embodiment 1. After the user's entry is retrieved, the attribute 65 for number of permissions of the user is checked (step S54). If the attribute 65 is negative, the user is recognized as a constant user and the user's password is confirmed (step S54). If the attribute 65 for number of permissions is positive, the user is recognized as a temporary user, the attribute 65 is decremented by 1 (step S55) and the user's password is confirmed (step S56). If the attribute 65 is zero, the user is refused to use the information processor (step S599).

As described above, the user recognize means 5 decreases automatically the number of permissions by 1 at every access (log-in) of the user having a positive number as the attribute 65 for number of permissions. When the attribute 65 for number of permissions becomes zero, the user is not permitted to access the information processor. Accordingly, a temporary user has to be permitted the right to use the information processor by the manager every predetermined number of accesses. This prevents the information processor from being improperly used. This embodiment is effective when a certain number



of accesses are needed for one purpose, for example, in case of the fault diagnosis of the hardware, where a lot of times of log-ins are required to diagnose the hardware fault. The user does not need to be permitted the right to use the information processor every log-in by the manager of the information processor according to this embodiment.

The attribute 63 for temporary use may be included in the user directory 6 as well as in Embodiment 1, though the attribute 63 is not included in the user directory 6 in Embodiment 2. In this case, a constant user is not identified by the attribute 65 for number of permissions, but specified by the attribute 63 for temporary use.

Embodiment 3.

Figs. 6 and 7 show another embodiment, where the temporary right to use is permitted by the manager and the right is automatically cancelled without an intervention of the manager. A general configuration of this embodiment is the same as shown in Fig. 1 of Embodiment 1. In this embodiment, the temporary right to use is cancelled when predetermined length of time has passed after permission.

Fig. 6 shows an example of the user directory 6 according to Embodiment 3. In this example, the user

directory 6 includes an attribute 66 for time limit as well as the user name 61, the password 62, and the attribute 63 for temporary use. The attribute 66 for time limit shows a time, until when the user's temporary right to use is valid. For example, a user AAA in Fig. 6 has a temporary right to use and his time limit is 13:54:20 on April 30, 1994. Fig. 7 is a flowchart showing the operation of the user recognize means 5 in this embodiment.

The operation of the embodiment will be described mainly in relation to different aspects from Embodiment 1 referring to Figs. 6 and 7. In this embodiment, the manager updates the attribute 66 for time limit in the user directory 6 by adding predetermined length of time to permit a temporary user the right to use the information processor, while the attribute 64 for permission is updated to permit a temporary user the right to use in Embodiment 1.

In the operation of the user recognize means 5, the procedure from step S71, where the user name and the password are input, to step S74, where it is checked whether the user is a temporary user or not, is the same as from step S31 to step S34 in Fig. 3 of Embodiment 1. If the user is not a temporary user, the user is recognized as a constant user and the user's password is

confirmed (step S76). If the user is a temporary user,  
the attribute 66 for time limit is compared with current  
time to check whether the user is permitted to use or not  
(step S75). If the current time is before the time limit  
5 set by the attribute 66 for time limit, the procedure is  
forwarded to step S76, where the user's password is  
confirmed. If the current time is after the time limit  
set by the attribute 66 for time limit, the user is  
refused to use the information processor (step S799).

10 As has been described, in this embodiment, the  
temporary right to use is permitted to the temporary user  
by the manager, and the right becomes automatically  
invalid after the predetermined length of time has  
passed. The temporary user has to be permitted the right  
15 to use by the manager for accessing the information  
processor every predetermined length of time. This  
prevents the information processor from being improperly  
used.

#### Embodiment 4.

20 Figs. 8 - 10 explain another embodiment, where the  
temporary right to use is automatically permitted to the  
temporary user under predetermined condition. The  
temporary right to use can be automatically cancelled by  
any way of the above three embodiments (Embodiment 1 -  
25 3). In the following explanation, the temporary right to

use is canceled by the way of Embodiment 1.

Fig. 8 shows a general configuration according to Embodiment 4 of the invention. Registers 11 and 12 hold events and their values of the condition of the trigger for permitting the right to use. In Fig. 8, for example, the register 11 holds current time and the register 12 holds a number of faults. The condition for permitting the right to use is registered in a condition directory 10 corresponding to each event. A condition judge means 9 observes occurrence of each event. When an event occurs, the condition judge means 9 judges whether the predetermined condition is fulfilled by the event or not referring to the condition directory 10. If the condition is fulfilled, the condition judge means 9 permits a proper temporary user the temporary right to use by updating the user directory 6. The other elements in Fig. 8 operate in the same way as the corresponding elements shown in Fig. 1.

Fig. 9 shows an example of the condition directory 10. In Fig. 9, variables 71, registered as events in the registers 11 and 12, respectively, and their reference values 72, and relations 73 between the variables 71 and the reference values 72 are registered as the condition. And a type of the variables (e.g., number, time, character string) is registered as a variable class 77

for indicating what should be compared to check the relation between the variable 71 and the reference value 72. Fig. 10 is a flowchart showing the operation of the condition judge means 9.

5           The operation will be explained below referring to Figs. 8 - 10. The condition judge means 9 observes the events (variables) registered in the registers 11 and 12 of the information processor 3, which are specified in the condition directory 10. The condition judge means 9  
10 observes the change of the value of the events by retrieving a value of the variable periodically, or being informed by an interruption when the value changes. In Fig. 9, for example, "current time" and "number of failures" are registered and observed as the events.

15           When the condition judge means 9 detects the change of the value of the variable observed, the condition judge means 9 judges whether the change fulfills the condition or not in the procedure shown in the flowchart of Fig. 10. At step S101, the condition judge means 9  
20 obtains the changed variable 71 and its value from the register 11 or 12. For example, if the "number of failures" changes, the changed value of the variable is read from the register 12. Then, the condition entry corresponding to the changed variable is retrieved from  
25 the condition directory 10 (steps S102, S103). When no

condition entry corresponding to the changed variable exists (step S103), the condition judge means 9 does not operate in the further steps. In this example, the second entry of Fig. 9 is selected. Referring to the retrieved entry, the variable 71 is compared with the corresponding reference value 72, and it is checked whether the predetermined relation 73 can be applied or not (step S104). When the relation 73 cannot be applied to the changed variable and the reference value even if there exists the corresponding condition entry (step S104), the condition judge means 9 neither operates in the further steps.

When the relation 73 can be applied to the changed variable and the reference value, the condition judge means 9 updates the user directory 6 (step S105). All the users having the attribute 63 for temporary use as shown in Figs. 2A and 2B are detected, and the attribute 64 for permission of all the detected temporary users are updated to permission. In case of the second entry shown in Fig. 9, when the "number of failures" of the hardware exceeds 5, the user directory is updated. Both the temporary users AAA and DDD of Figs. 2A and 2B are permitted the right to use.

As has been described, the temporary right to use can be permitted to all the temporary users

automatically, the intervention of the manager becomes thus unnecessary.

As shown in Fig. 9, if "current time" is set as the condition, the temporary right to use can be permitted to  
5 a proper temporary user automatically at predetermined time. This is effective in case of periodical maintenance. It is possible to set various kinds of the condition as well as the current time and the number of failures, for example, miss-load of initial program,  
10 lack of source as lack of available memory, load excess caused by large number of log-in users, etc.

The temporary right to use is cancelled by recognition of the user with the user recognize means 5 when the temporary user logs in as described in  
15 Embodiment 1. The temporary right to use also can be cancelled in either way described in Embodiment 2 or 3. Embodiment 5.

Figs. 11 and 12 show another embodiment. In this embodiment, the temporary right to use is permitted  
20 automatically when an event occurs to fulfill the predetermined condition. In Fig. 11, an example of the configuration of the condition directory is shown according to Embodiment 5. A user 74 is added to the condition directory 10 of Embodiment 4 for specifying a  
25 proper user to permit the right to use when the condition

is fulfilled. Fig. 12 is a flowchart showing the operation of the condition judge means 9. In this embodiment, the temporary right to use is permitted only to the specified user corresponding to the condition when an event occurs to fulfill the condition. A general configuration of this embodiment is the same as shown in Fig. 8 of Embodiment 4. As well as Embodiment 4, the temporary right to use can be cancelled in any way of Embodiments 1, 2 and/or 3. In the following explanation, the right to use is cancelled in the way described in Embodiment 1.

In the operation of this embodiment is the same from the start to step S124 in Fig. 12, where the condition to permit the right to use is judged, as Embodiment 4. When the condition is fulfilled, the condition judge means 9 updates the user directory 6. A temporary user, specified as the user 74 in the condition entry of the condition directory 10 corresponding to the fulfilled condition, is retrieved from the user directory 6 shown in Figs. 2A and 2B (steps S125 and S126). The attribute 64 for permission of the retrieved user is updated to permission (step S127). In Fig. 11, when the number of failures (of the hardware) exceeds 5, the user directory is updated to permit only the temporary user DDD of Figs. 2A and 2B the temporary right to use. The first entry of



the condition directory shown in Fig. 11 means the temporary right to use is permitted to the temporary user AAA of Figs. 2A and 2B at a predetermined time.

5 Accordingly, this embodiment enables to permit only the specified temporary user the temporary right to use correspondingly to the condition fulfilled by the occurred event without the intervention of the manager.

10 In this embodiment, the temporary right to use is cancelled by recognition of the user with the user recognize means 5 when the user logs in as described in Embodiment 1.

Embodiment 6.

15 Figs. 13 - 15 show another embodiment. In this embodiment, the temporary right to use is permitted automatically when an event occurs to fulfill the predetermined condition. In Fig. 13, an example of the configuration of the condition directory is shown according to Embodiment 6. A user class 75 is added to the condition directory 10 of Embodiment 4 for specifying a class of the temporary user to permit the right to use when the condition is fulfilled. In Fig. 14, an example of the configuration of the user directory 6 is shown according to Embodiment 6. An attribute 67 for class, corresponding to the user class 75 in the condition directory 10, is added to the user directory 6 of.

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Embodiment 1. Fig. 15 is a flowchart showing the operation of the condition judge means 9. In this embodiment, the temporary right to use is permitted only to the specified class of the users automatically. The class of the users corresponds to an occurred event when the event occurs to fulfill the condition. A general configuration of this embodiment is the same as Fig. 8 of Embodiment 4.

As well as Embodiment 4, the temporary right to use can be cancelled in any way of Embodiments 1, 2 and/or 3. In the following explanation, the right to use is cancelled in the way described in Embodiment 1.

In the operation of this embodiment is the same from the start to step S154 in Fig. 15, where the condition to permit the right to use is judged, as Embodiment 4.

When the condition is fulfilled, the condition judge means 9 updates the user directory 6. A temporary user, who has the attribute 67 for class matching the user class 75 of the condition entry corresponding to the condition, is retrieved from the user directory 6 (steps S155 and S156). The attribute 64 for permission of the retrieved user is updated to permission (step S157). In Fig. 13, when the number of failures (of the hardware) exceeds 5, the user directory is updated to permit the temporary user DDD of class 2 of Fig. 14 the temporary

right to use. The first entry of the condition directory of Fig. 13 means the temporary right to use is permitted to the temporary users AAA and EEE of class 1 shown in Fig. 14 at a predetermined time.

5           Accordingly, this embodiment enables to permit only the temporary users of the class specified in the condition entry the temporary right to use automatically without the intervention of the manager. In this embodiment, the temporary right to use is permitted to a  
10           group of temporary users corresponding to the condition fulfilled by an occurred event, so that the right to use can be permitted more flexibly compared with the above Embodiments 4 and 5.

          In this embodiment, the temporary right to use is  
15           cancelled by recognition of the user with the user recognize means 5 when the temporary user logs in as described in Embodiment 1.  
          Embodiment 7.

          Figs. 16 and 17 show another embodiment. In this  
20           embodiment, when an event occurs to fulfill the predetermined condition, the temporary right to use is permitted to the temporary users of the specified user class corresponding to the condition automatically. And the temporary right to use of the users of the specified  
25           user class is cancelled automatically when another event

occurs to fulfill another predetermined condition. Fig. 16 shows the condition directory according to this embodiment. As shown in Fig. 16, the user class 75 and an attribute 76 for operation are added to the condition directory 10 of Embodiment 4. The user class 75 specifies a group of temporary users to permit or to cancel the right to use when an event occurs to fulfill the condition. The attribute 76 for operation shows permitting/cancelling the right to use. Fig. 17 is a flowchart showing the operation of the condition judge means 9. In this embodiment, the user directory is the same as Embodiment 6. A general configuration of this embodiment is the same as Embodiment 4 shown in Fig. 8.

In the operation of this embodiment is the same from the start to step S174, where the condition to permit the right to use is judged, as Embodiment 4.

The condition judge means 9 observes the variables and obtains a changed variable and its value when the variable changes (step S171). For example, the number of failures changes, the changed value is read from the predetermined position (the register 12). The condition judge means 9 retrieves the condition entry corresponding to this changed variable from the condition directory 10 (steps S172, S173). In an example of Fig. 16, a third entry and a fourth entry are retrieved. If there is a

condition entry corresponding to the changed variable.  
the variable 71 is compared with the corresponding  
reference value 72 to check whether the predetermined  
relation 73 can be applied or not (step S174). If no  
5 condition entry exists corresponding to the changed  
variable, the condition judge means 9 does not operate.  
Neither the condition judge means 9 operates if the  
predetermined relation 73 cannot be applied even when  
there exists a corresponding condition entry.

10           When the relation 73 can be applied between the  
changed variable 71 and the reference value 72, the  
condition judge means 9 updates the user directory 6.  
The condition judge means 9 retrieves the user, who has  
the attribute 67 for class matching the user class 75 of  
15 the entry corresponding to the condition specified in the  
condition directory 10, from the user directory 6 shown  
in Fig. 14 (steps S175, S176). If the attribute 76 for  
operation of the condition entry corresponding to the  
fulfilled condition is "permit" (step S177), the  
20 attribute 64 for permission of the user is changed to  
permission (step S178). If the attribute 76 for  
operation of the condition entry is "cancel" (step S177),  
the attribute 64 for permission of the user is changed to  
refusal (step S179). In Fig. 16, for example, the  
25 "number of failures" of the hardware exceeds 5, the user

directory 6 is updated. The temporary right to use is permitted to the user DDD having 2 as the attribute 67 for class shown in Fig. 14. On the contrary, when the "number of failures" of the hardware is less than 3, the temporary right to use of the user DDD having 2 as the attribute 67 for class in Fig. 14 is cancelled. A first entry of the condition directory of Fig. 16 means the temporary right to use should be permitted to the temporary users AAA and EEE having 1 as the attribute 67 for class in Fig. 14 at a specified time. On the contrary, a second entry of the condition directory 6 of Fig. 16 means the right to use of the users AAA and EEE having 1 as the attribute 67 for class in Fig. 14 should be cancelled automatically at a time specified in the second entry.

As has been described, the temporary right to use can be permitted to the specified class of the temporary users automatically and the temporary right to use can be cancelled automatically, thus the intervention of the manager becomes unnecessary. This prevents permitting/cancelling the right to use from human error, the information processor thus is not used improperly.

In this embodiment, the condition to cancel the temporary right to use can be specified in detail more than the above Embodiments 1 - 3. A complex condition,

for example, "in case the accumulation of using time of CPU exceeds 5 minutes", can be specified. This enables to manage the system more flexibly.

5 This Embodiment 7 is an improved application of Embodiment 6. The Embodiment 7 is also applicable to Embodiments 4 and 5. Namely, the condition directory 10 of Fig. 16 is applicable to Embodiment 4, where the right to use is permitted to all the temporary users and the right to use of all the temporary users is cancelled without specifying a group of the users by the user class 75. Also, the condition directory 10 of Fig. 16 is applicable to Embodiment 5, where the right to use is permitted to a temporary user specified by the user 74 of the condition directory shown in Fig. 11 and the right to use of the specified temporary user is cancelled automatically without specifying a group of the users by the user class 75.

15 In the above Embodiment 1 - 7, the user logs in the information processor 3 with the terminal 1 or 2. And the terminals 1 and 2 are connected to the information processor 3 via the communication network 4. These embodiments can be applied to another configuration, where the terminals are connected directly to the information processor 3.

25 Having thus described several particular embodiments

of the invention, various alterations, modifications, and improvements will readily occur to those skilled in the art. Accordingly, the foregoing description is by way of example only, and the invention is limited only as defined in the following claims.

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# CLAIMS

1. An information processor comprising:

(a) a user directory for registering a user name, a user's password and an attribute for a user's right to use;

(b) directory update means for updating the attribute for the right to use of the user directory to permit the user the right to use the information processor; and

(c) user recognize means for recognizing the user on logging in, for judging the user's right to use the information processor by referring to the user directory, and for updating the user directory to cancel the right to use of the user.

2. An information processor according to claim 1,

wherein the attribute for the user's right to use comprises:

an attribute for temporary use showing whether a user is a temporary user or not; and

an attribute for permission showing whether the user is permitted to use the information processor or not.

3. An information processor according to claim 1 or 2,

wherein the attribute for the user's right to use comprises an attribute for a number of permissions showing a number of times the user is permitted to use the information processor.

4. An information processor according to claim 1, 2 or 3, wherein the attribute for the user's right to use comprises:

5 an attribute for time limit showing time limit until when the user is permitted to use the information processor.

5. An information processor comprising:

10 (a) a user directory for registering a user name, a user's password and an attribute for a user's right to use;

(b) a condition directory for registering a condition to permit a temporary right to use; and

15 (c) condition judge means for judging a fulfillment of the condition specified in the condition directory and for updating the user directory to permit the user the temporary right to use when the condition is fulfilled.

20 6. An information processor according to claim 5, wherein the condition directory registers a user corresponding to the condition to permit the right to use the information processor when the condition is fulfilled.

7. An information processor according to claim 5 or 6, wherein the condition directory comprises a condition for cancelling the user's right to use.

25 8. An information processor according to claim 5, 6 or

7. further comprising:

user recognize means for recognizing the user on logging in, for judging the right to use of the user by referring to the user directory, and for updating the user directory to cancel the right to use of the user.

9. An information processor according to any one of the preceding claims,

wherein the attribute for the user's right to use comprises an attribute for a user class to permit a user of the class the right to use the information processor.

10. A method of permitting a temporary user a temporary right to use an information processor comprising the steps of:

inputting a user name and a password on logging in the information processor;

retrieving a user's entry from a user directory;

checking the user's entry to determine whether the user is permitted to use the information processor;

updating the user's entry of the user directory to cancel the user's temporary right to use for next log-in;

confirming the password referring to the user directory; and

permitting the user the temporary right to use the information processor after the password is confirmed.

11. A method according to claim 10 further comprising a

step of:

checking the user's entry to determine whether the user is a temporary user or not.

12. A method according to claim 10 or 11, further comprising the steps of:

checking, after the checking step, a number of permissions of the user's entry to determine whether the user is permitted to use; and

decreasing the number of permissions of the user's entry in the user directory by 1 when the number of permissions is detected as positive.

13. A method according to claim 10, 11 or 12, further comprising a step of:

comparing, after the checking step, current time with a time limit specified in the user directory to determine whether the user is permitted to use.

14. A method of permitting a temporary user a temporary right to use an information processor comprising the steps of:

monitoring a variable specified in a condition directory;

judging whether or not the variable satisfies a condition stored in the condition directory; and

permitting a temporary user specified in a user directory the temporary right to use the information

processor when the condition is judged as fulfilled at the judging step.

15. A method according to claim 14. further comprising a step of:

5           updating the user directory to cancel the user's right to use the information processor when the user logs in.

16. A method according to claim 14 or 15. further comprising a step of:

10           retrieving a user's entry corresponding to the condition from the user directory after the judging step.

17. A method according to any one of claims 10 to 16. further comprising a step of:

15           retrieving a user's entry of a class corresponding to a user class to determine if the user is permitted to use the processor.

18. A method according to claim 16 further comprising a step of:

20           checking an attribute of the user's entry to determine if the user is permitted to use the processor.

19. An information processor constructed and arranged to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

25           20. A method of permitting temporary use of an

information processor substantially as hereinbefore  
described with reference to and as illustrated in the  
accompanying drawings..

Amendments to the claims have been filed as follows

1. An information processor comprising:

(a) a user directory for registering a user name, a user's password and an attribute for a user's right to use;

(b) directory update means for updating the attribute for the right to use of the user directory to permit the user the right to use the information processor; and

(c) user recognize means for recognizing the user on logging in, for judging the user's right to use the information processor by referring to the user directory, and for updating the user directory automatically to cancel the right to use of the user.

2. An information processor according to claim 1, wherein the attribute for the user's right to use comprises:

an attribute for temporary use showing whether a user is a temporary user or not; and

an attribute for permission showing whether the user is permitted to use the information processor or not.

3. An information processor according to claim 1 or 2, wherein the attribute for the user's right to use comprises an attribute for a number of permissions showing a number of times the user is permitted to use the information processor.

4. An information processor according to claim 1, 2 or 3, wherein the attribute for the user's right to use comprises:

an attribute for time limit showing time limit until when the user is permitted to use the information processor.

5. An information processor comprising:
- (a) a user directory for registering a user name, a user's password and an attribute for a user's right to use;
  - 5 (b) a condition directory for registering a condition to permit a temporary right to use; and
  - (c) condition judge means for judging a fulfilment of the condition specified in the condition directory and for updating the user directory
  - 10 automatically to permit the user the temporary right to use when the condition is fulfilled.
6. An information processor according to claim 5, wherein the condition directory registers a user corresponding to the condition to permit the right to use
- 15 the information processor when the condition is fulfilled.
7. An information processor according to claim 5 or 6, wherein the condition directory comprises a condition for cancelling the user's right to use.
8. An information processor according to claim
- 20 5, 6 or 7, further comprising:
  - user recognize means for recognizing the user on logging in, for judging the right to use of the user by referring to the user directory, and for updating the user directory to cancel the right to use of the user.
- 25 9. An information processor according to any one of the preceding claims,
- wherein the attribute for the user's right to use comprises an attribute for a user class to permit a user of the class the right to use the information
  - 30 processor.



10. A method of permitting a temporary user a temporary right to use an information processor comprising the steps of:

- inputting a user name and a password on logging
- 5 in the information processor;
- retrieving a user's entry from a user directory;
- checking the user's entry to determine whether the user is permitted to use the information processor;
- updating the user's entry of the user directory
- 10 automatically to cancel the user's temporary right to use for next log-in;
- confirming the password referring to the user directory; and
- permitting the user the temporary right to use
- 15 the information processor after the password is confirmed.

11. A method according to claim 10 further comprising a

processor automatically when the condition is judged as fulfilled at the judging step.

15. A method according to claim 14, further comprising a step of:

5 updating the user directory to cancel the user's right to use the information processor when the user logs in.

16. A method according to claim 14 or 15, further comprising a step of:

10 retrieving a user's entry corresponding to the condition from the user directory after the judging step.

17. A method according to any one of claims 10 to 16, further comprising a step of:

15 retrieving a user's entry of a class corresponding to a user class to determine if the user is permitted to use the processor.

18. A method according to claim 16 further comprising a step of:

20 checking an attribute of the user's entry to determine if the user is permitted to use the processor.

19. An information processor constructed and arranged to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

25 20. A method of permitting temporary use of an